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THE PLANT DISEASE REPORTER

Issued by

THE PLANT DISEASE SURVEY, DIVISION OF MYCOLOGY AND DISEASE SURVEY
BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING
AGRICULTURAL RESEARCH ADMINISTRATION
UNITED STATES DEPARTMENT OF AGRICULTURE

Volume XXIX May 1, 1945 Number 15

The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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U. S. DEPARTMENT OF AGRICULTURE

CHECK LIST REVISION

Freeman Weiss

PHALARIS (GRAMINEAE)

PHALARIS ARUNDINACEA L., REED CANARY GRASS (1), including var. PICTA L., RIBBON GRASS (2). Tall perennial of moist habitats occurring throughout the U. S. except the South and extending to Alaska; an important constituent of lowland hay and source of food for wildlife. The var. (2) is grown for ornament. P. CALIFORNICA Hook. & Arn., CALIFORNIA CANARY GRASS (3), of similar habit, occurs near the coast in southern Oreg. and northern Calif.

Claviceps purpurea (Fr.) Tul., ergot. Me. to Va., Okla. and Mont (1); N. Y. (2).
Colletotrichum graminicolum (Ces) G. W. Wils., anthracnose. Wash. (1).
Erysiphe graminis DC., powdery mildew. Wash., Wis. (1).
Helminthosporium sp., leaf spot. Minn., N. Car. (1).
H. giganteum Heald & Wolf, eye spot. Md. (2).
H. sativum Pam. King & Bakke, leaf spot. Md., Wis. (1).
Ophiocladium hordei Cav., on fading leaves. Wis. (1).
Phaeoseptoria sp., on leaves. Oreg. (1).
Phyllachora phalaridis Orton, tar spot. Mass. (1).
Puccinia coronata Cda. (II, III), crown rust. Wash. (1).
P. graminis Pers. (II, III), stem rust. Calif., N. Y. (1); Calif. (3). Var. avenae Eriks. & Henn. identified.
P. sessilis Schneid. (II, III), leaf rust. N. Y. to Ind., Colo. and Oreg. (1); Calif. (3). O and I on Iris versicolor L., and various Liliaceae (Convallariaceae).
Pythium debaryanum Hesse, root rot. N. Dak. (1).
Selenophoma donacis (Pass.) Sprague & A. G. Johns., speckle. N. Dak. (1).
Sclerotium rhizodes Auers., leaf rot. Wis. (1).
Septoria bromi Sacc., leaf spot. Oreg., Wash. (1).
Stagonospora arenaria Sacc., leaf spot. Iowa, N. & S. Dak., Wis. (1); Calif. (3).
S. foliicola (Bres.) Bub. N. Dak. (1).
S. intermixta (Cke.) Sacc. Wis. (1).
Ustilago echinata Schroet., leaf smut. Mich., Nebr., N. & S. Dak., Wash. (1).
U. hypodytes (Schlecht.) Fr., stem smut. Wash. (1).
U. striaeformis (West.) Niessl, stripe smut. Me. (1).

P. CANARIENSIS L., CANARY GRASS (1). Annual of western Mediterranean region, cult. for bird seed and widely but thinly established in waste ground chiefly in the Eastern and Central States. P. PARADOXA L. (2) of similar habit and origin, is infrequent. P. CAROLINIANA Walt., CAROLINA C. G. (3) and P. ANGUSTA Nees, TIMOTHY C. G. (4), are native annuals occurring in moist habitats of lowlands from the Gulf States to the Pacific Coast. All furnish food for wildlife.

P. CANARIENSIS cont.

Cladosporium velutinum Ell. & Tracy, leaf spot. Miss. (1).
Claviceps purpurea (Fr.) Tul., ergot. Mich., Minn. (1).
Puccinia coronata Cda. (II, III), crown rust. (1, 3). Natural infection reported in PDR Suppl. 130.
P. glumarum (Schm.) Ericks. & Henn. (II, III), stripe rust. Calif. (2).
P. graminis Pers. (II, III), stem rust. Tex. (3), Okla. (4). Var. avenae Ericks. & Henn. identified.
P. sessilis Schneid. (II, III), leaf rust. Calif. (3), Okla. (4).

P. TUBEROSA L., BULB CANARY GRASS, and especially the var. STENOPTERA (Hack.) Hitchc., HARDING GRASS, "PERUVIAN" WINTER G. Perennial of the Mediterranean region; introduced as a promising forage grass.

Fusarium equiseti (Cda.) Sacc. and F. scirpi C. R. Lambert & Fautr. var. acuminatum (Ell. & Ev.) Wr., root rot. N. Dak.
Helminthosporium sativum Pam. King & Bakke, leaf spot. Oreg.
Mycosphaerella tulasnei Jacz. (Cladosporium herbarum Pers. ex Lk.), leaf mold. Oreg.
Phaeoseptoria sp., on leaves. Oreg.
Puccinia sessilis Schneid. (II, III), leaf rust. Oreg.
Rhizoctonia solani Kuehn, secondary root rot. Oreg.

PHLEUM (GRAMINEAE)

PHLEUM ALPINUM L., ALPINE TIMOTHY. Perennial of northern latitudes of both hemispheres occurring in New England, northern Mich., and in mountain meadows of the Western States; of minor forage value. P. BOEHMERI Wibel (2), of Eurasia has been grown in grass nurseries.

Leptosphaeria vagans Karst., on dead stems. Calif.
Mycosphaerella tulasnei Jacz. (Cladosporium herbarum Pers. ex Lk.) leaf mold. Calif.
Puccinia graminis Pers. (II, III), stem rust. Calif., Wash. (2).
P. poae-sudeticae (West.) Jørst. (II, III), leaf rust. Colo. O and I unknown.
Ustilago hypodytes (Schlecht.) Fr., stem smut. Wash.

PHLEUM GRAECUM Boiss & Heldr. (1), P. PANICULATUM Huds. (2); annuals of the Mediterranean region, grown in grass nurseries in the U. S. P. PHLEOIDES (L.) Karst. (3), a Brasilian sp. also has been tested here.

Fusarium scirpi C. R. Lambert & Fautry var. acuminatum (Ell. & Ev.) Wr., root rot. N. Dak. (3).
Heterosporium phlei Greg., leaf spot. Wash. (3).
Puccinia graminis Pers. (II, III), stem rust. Calif. (3), ? Oreg. (2), Wash. (1, 3).

PHLEUM GRAECUM cont.

Ustilago hypodytes (Schlecht.) Fr., stem smut. Wash. (3).

PHLEUM PRATENSE L., TIMOTHY. Perennial, possibly native to N. America and introduced to cultivation here, or of Eurasian origin; principal hay grass of the U. S., cult. in all humid areas except the South.

Ascochyta sp., leaf spot. Minn.
Claviceps purpurea (Fr.) Tul., ergot. Widespread but not frequent. Often reported as C. microcephala (Wallr.) Tul., a distinction difficult to maintain.
Colletotrichum graminicolum (Ces.) G. W. Wils., anthracnose. Ill., Ind., Minn., Mo., N. J., Ohio, Pa.
Curvularia sp., leaf mold. Mo.
Diaporthe arctii (Lasch) Nits., on culms. N. J.
Ditylenchus dipsaci (Kuehn) Filip., stem nematode. N. Y.
Entyloma crastophilum Sacc., leaf smut. Ill., Iowa, Wis.
Epichloë typhina Pers ex Fr., choke. Me., Pa.
Ersiphe graminis DC., powdery mildew. Minn., Pa.
Fusarium equiseti (Cda.) Sacc., root rot. N. Dak.
F. heterosporum Nees, head mold. Minn., W. Va., Wis. Probably secondary to ergot.
F. poae (Pk.) Wr., silver top. Ind., Iowa, Minn., N. Y.
F. scirpi C. R. Lambert & Fautr. var. acuminatum (Ell. & Ev.) Wr., secondary root rot. N. Dak.
Helminthosporium sp., leaf spot. Conn., Mo.
H. giganteum Heald & Wolf. Md.
H. sativum Pam. King & Bakke, leaf spot, root rot. Wash.
Heterosporium phlei Greg., purple leaf spot. Mass. to Ky. and Minn.; Oreg., Wash.
Lophodermium arundinaceum (Schrad. ex Fr.) Chev. var. gramineum Duby, on leaves. N. J., Ohio, Va.
L. phlei Tehon, on leaves and culms. N. J.
Macrophoma phlei Tehon & Stout, on leaves, ? leaf blight. Ill.
Ophiobolus graminis Sacc., root & stem rot. N. Y.
Phyllachora graminis (Pers. ex Fr.) Fckl., tar spot. Me.
Physalospora oxystoma Sacc. & Ell. on dead culms. N. J.
Puccinia coronata Cda. (III, ? III), crown rust. Iowa, W. Va. Resistant.
P. graminis Pers. var. phlei-pratensis (Eriks. & Henn.) Stakman & Piemeisel (II, III), stem rust. General. In addition to this var. of P. graminis, which commonly infects timothy, natural infection by the var. avenae Eriks. & Henn. is reported in PDR. Suppl. 130.

Rhizoctonia solani Kuehn, root rot. N. Dak.
Rostrosphaeria phlei Tehon & Daniels, on dead leaves. Ill.
Sclerotium rhizodes Auers., leaf rot. Wis.
Scolecotrichum graminis Fckl., brown stripe. General.
Selenophoma donacis (Pass.) Sprague & A. G. Johns., speckle. Alaska.
Septoria sp., leaf spot. Ill., Pa.
Sirococcus phlei Tehon & Daniels. on dead stems. Ill.
Sphaeropsis phlei Ell. & Ev. (? Macrophoma phlei Tehon & Stout), on leaves. N. J., Va.

PHLEUM PRATENSE cont.

(Sporotrichum poae Pk.): Fusarium poae.
? Urocystis agropyri (Preuss.) Schroet., flag smut. Mo., Vt.
Ustilago striaeformis (West.) Niessl, stripe smut. General. In the classification of formae speciales of this fungus proposed by W. H. Davis the timothy form is designated forma phlei. It has been given specific rank, U. phlei-pratensis, by Liro.

Bends -- cause unknown. Wash.

Virescence (leafy proliferation of florets) -- cause unknown. Conn., Ind., Va.

PHRAGMITES (GRAMINEAE)

PHRAGMITES COMMUNIS Trin., COMMON REED. Robust perennial growing in shallow water and marshes throughout the U. S.; the seed an important source of food for wildlife, the culms used in matting, thatching, and cordage by the aborigines.

Claviceps purpurea (Fr.) Tul., ergot. N. J., Okla.
Coniosporium arundinis (Cda.) Sacc. and other spp. See Papularia.
Graphyllium dakotense Rehm and G. graminis (Ell. & Ev.) Rehm, on dead culms. N. Dak.
Helminthosporium sp., leaf spot. See also Napicloadium.
Hendersonia arundinacea (Desm.) Sacc., on leaf sheaths and culms. N. Dak., Tex.
H. grantii Dearn. Wash. See also Stagonospora.
Lophiostoma arundinis (Fr.) Ces. & De Not., on culms. N. Dak.
Mycosphaerella sp. (Sphaerella phragmitis Ell. & Ev.), on leaves. Ind.
Napicladium arundinaceum (Cda.) Sacc., leaf spot. Minn., Nebr., N. Dak., Wis.
Neovossia iowensis Hume & Hodson, seed smut. Conn., Iowa.
Phragmopeltis phragmitis Dearn., on dead culms. Wash.
Pseudographis phragmitis Dearn. & House, on dead culms. N. Y.
Puccinia magnusiana Koern. (II, III), yellow leaf rust. Iowa, Nebr., N. Y., N. & S. Dak., Wis. O and I on Anemone canadensis L.
P. phragmitis (Schum.) Koern. (II, III), brown leaf rust. Conn. to Del., Colo. and Wash. O and I on Rumex spp. and Rheum rhaponticum L.
Pythium debaryanum Hesse and P. ultimum Trow, root rot. N. Dak.
Rhopographus clavisporus (Cke. & Pk.) Sacc., on dead culms. Iowa, N. Y., N. & S. Dak.
Scolecotrichum graminis Fckl., brown stripe. Wis.
S. maculicola Ell. & Kell., leaf spot. Iowa, Kans., Nebr., Oreg., Wis.
Stagonospora graminella Sacc., leaf spot. N. Dak. The Hendersonia -- Stagonospora complex on Phragmites can not be resolved without the study of cultures. Some reports of Hendersonia arundinacea should perhaps be referred to S. vexata Sacc. One or more of these appears to be the conidial stage of Leptosphaeria arundinacea (Sow. ex Fr.) Sacc.
S. phragmitis Ell. & Ev., on leaves. Ind. Associated with Mycosphaerella sp.

LATE BLIGHT OF POTATOES IN BALDWIN COUNTY, ALABAMA, IN 1945

G. M. Stone and Coyt Wilson[1]

The history of late blight (Phytophthora infestans) in Baldwin County, Alabama, is unique in that there are no authentic records of its occurrence prior to 1940. During that season it was found in the County by Dr. Henry M. Darling, pathologist stationed in the area from 1936 to 1940. In 1940, only a trace of late blight was found. Following this, there was a gradual increase in its prevalence until 1944, when more than 60% of the crop was destroyed.

The distribution and severity of late blight this year, as of April 13, is shown on the map (Figure 1). The first observation of the disease was on April 2 in the Bon Secour section. Bon Secour, as will be seen on the map, is in the southern tip of the County and is very close to Mobile Bay. The land is low-lying and is often blanketed at night with heavy fogs. As shown in Table 1, rain preceded the disease outbreak. Two weeks of relatively dry weather followed, and blight development was slow.

It appears from field observation that blighted seed potatoes were the source of practically all the late blight that has developed to date. Wind dissemination of inoculum appears to have played a minor role. In fields where considerable late blight has developed, the focal point of infection usually could be found. The degree of infection diminished rapidly in all directions from these centers.

About 50% of the crop was planted during the latter part of January and the first part of February; the remainder was planted after February 15. The early potatoes have already made 70 to 80% of a full crop. Late blight could be found in most of the fields of early potatoes. In several fields most of the plants had been killed, but the reduction in yield would not exceed 20 to 30%. Unless tuber rot develops, the disease will do little additional damage. The greatest danger is to the late crop. Abundant inoculum is present, and if weather conditions should become conducive, the disease can rapidly reach epidemic proportions.

Late blight is a serious menace to potato production in Baldwin County. The last 6 weeks of the potato season is the critical period for development of this disease. When uniformly distributed, the average rainfall during this period (Table 1) is sufficient to permit an epiphytotic.

At present very few growers are equipped to spray properly. Some dusting is being done both by airplane and power dusters, but there is little evidence of effective control.

On a trip through southeastern Alabama, April 26 to 28, the junior writer had an opportunity to make a further observation on the progress of late blight in Baldwin County. The disease has spread throughout the County and has been reported from adjoining counties to the north. Infection is general throughout practically all fields in all parts of the County. In the section south of Robertsdale (see Figure 1) the plants are completely killed in many of the fields. However, as mentioned above, those potatoes were planted early and have already made a normal crop. In the fields of young potatoes north of Robertsdale, late blight lesions are abundant, but the foliage has not been severely damaged at this date. The yield of

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[1]The writers wish to express their appreciation to Frank Garrett, Gulf Coast Substation, Fairhope, Alabama, for his able assistance in conducting this survey.

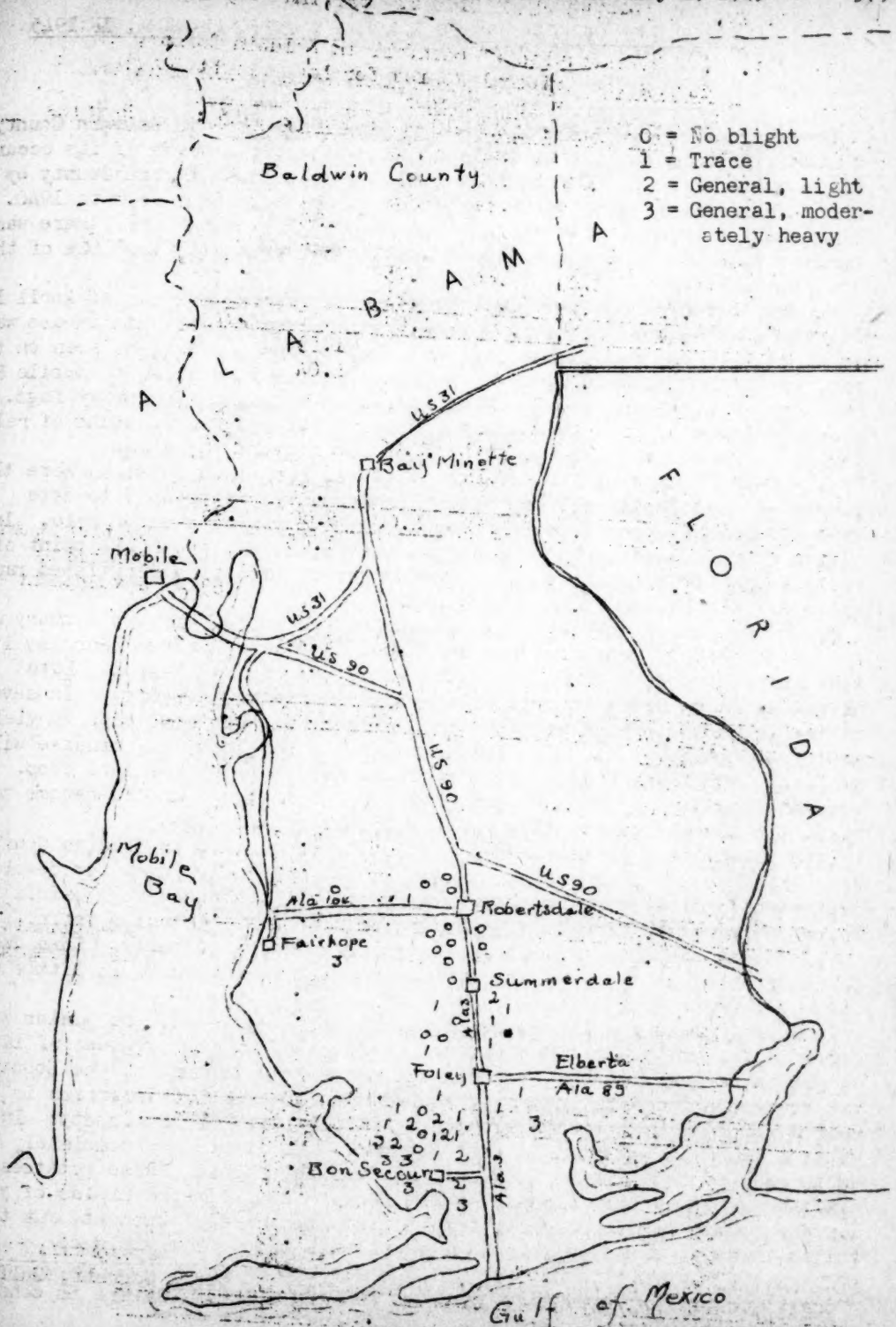

Figure 1. The distribution and severity of potato late blight in Baldwin County, Alabama, in 1945

Table 1. The Distribution of Rainfall in Baldwin County, Alabama during the Critical Period for Late Blight Development

Month	Day	Year : inches : 1940	1941	1942	1943	1944	1945	Remarks
March	15			.04	.02			
	16		.23	.02	.01			
	17			.39	.04			
	18					.20		
	19					.38		
	20		1.87	.60	.75		.70	
	21	.04	.09	1.58	.21			
	Total	.04	2.19	2.63	1.03	.58	.70	
	22					1.55		
	23	.16	.02			4.04		
	24	.03						
	25						.36	
	26			1.38	4.00		.59	
	27		.06	.14				
	28	.10				.01		
	Total	.29	.08	1.52	4.00	5.60	.95	
	29					1.65		Critical period for blight development
	30	1.34						
	31		2.00				.63	
April	1		.02					
	2				.04	1.22	1.75	
	3		2.37			.01		
	4							
	Total	1.34	4.39	00	.04	2.88	2.38	
	5	1.04					.35	
	6	.07					.29	
	7	1.16	.10					
	8							
	9			2.67	.90	3.58		
	10				.62	.22		
	11					2.13		
	Total	2.27	.10	2.67	1.52	6.93	.64	
	12	.98				.01		Approximate date of earliest dig
	13							
	14					.18		
	15					.58		
	16	.01						
	17	T		.23			.72	
	18	1.30			.65	.81		
	Total	2.29	00	.23	.65	1.58	.72	
	19	.23			.03	1.62		
	20	.02				.33		
	21					1.65		
	22							
	23					1.55		
	24		.68			.80		Approximate date of earliest general dig.
	25	.84				.11		
	Total	1.09	.68	00	.03	6.06		
GRAND TOTAL		7.32	7.44	7.05	7.27	23.63		

The long-time average for the period is about 7.50 inches.

these young fields will be reduced considerably because of late blight or because of early digging. Harvest is getting under way, and in some places 70-day-old potatoes are being dug because of the danger of late blight. When potatoes are dug at 70 days, the yield is usually about 60% of a full crop.

EMERGENCY PLANT DISEASE PREVENTION PROJECT AND ALABAMA AGRICULTURAL EXPERIMENT STATION

OTHER REPORTS ON POTATO LATE BLIGHT, AND REPORTS ON OTHER DISEASES OF POTATO, TOMATO, AND OTHER SOLANACEOUS CROPS

Except where noted, reports are of Emergency Plant Disease Prevention Project surveys.

LATE BLIGHT AND OTHER POTATO DISEASES IN SOUTH CAROLINA: In company with Dr. C. N. Clayton and Dr. C. N. Barnes of the South Carolina Truck Experiment Station, a survey of spring truck crop diseases was made in Charleston County, between April 13 and 17.

About 175 acres of potatoes in 14 fields were inspected. The most important disease present was late blight. Other diseases observed included early blight (Alternaria solani), southern blight (Sclerotium rolfsii), Rhizoctonia (R. solani), bacterial wilt (Pseudomonas solanacearum), and purple-top [? aster yellows virus]. Symptoms of virus diseases were observed, occurring in amounts from a trace up to 25%. The individual diseases could not always be distinguished but those believed to be present were rugose and mild mosaic, and leaf roll, the latter being the more common.

The first reports of late blight came from fields on James Island, Charleston County, on April 16. These fields were visited the next day with Dr. Clayton. One 9-acre field of White Rose was heavily infected, and the disease was observed in an adjacent 8-acre field of Cobbler and in other nearby fields. The White Rose seed was from Minnesota and was reported (PDR 29:258. 1945) as showing late blight rot when inspected in Charleston last winter. Dr. Clayton found a similar condition in fields in which the same seed was used on Edisto Island, Charleston County, and was able to trace infection to decayed seed pieces. -- Alton E. Prince.

POTATO LATE BLIGHT IN SOUTHERN LOUISIANA: Late blight apparently is developing again this year, but 2 or 3 weeks late. It appears to be rather widespread in Pointe Coupee Parish, and a few large fields with diseased spots were seen between Baton Rouge and New Orleans. -- Douglas C. Bain, Apr. 16-28.

DISEASES OF PEPPER, TOMATO, AND EGGPLANT IN SOUTHERN LOUISIANA: Mosaic (virus) is generally distributed in fields of bell peppers throughout southern Louisiana. Leaf spot (Cercospora capsici) was found on lower leaves in most fields examined. Infection was heavy in one field near Denham Springs.

From 3 to 5% of the 23,000 plants in one tomato field at Chalmette, below New Orleans, showed mosaic. This disease was found in trace amounts elsewhere below New Orleans. A very light infection of Alternaria solani was noted in most fields in this area.

On eggplant, leaf spot caused by Phomopsis vexans was observed in trace amounts in a few fields in Plaquemines Parish.--Douglas C. Bain, Apr. 16-28.

DAMPING-OFF IN TOBACCO AND PEPPERS: A severe case of damping-off was observed on tobacco and peppers (paprika) at the Pee Dee Station, Florence, South Carolina, in April 1945. Both tobacco and peppers were seeded in a bed of approximately 100 square yards in area. Of a total of 54 blocks of tobacco (3 feet square) 42 blocks were 100% killed and stands in the remaining 12 blocks were reduced approximately 75%. The peppers, seeded in rows, had stands reduced about 85%.

Isolation made from freshly wilted seedlings yielded Fusarium spp. from both tobacco and peppers.

A point of particular interest is that this bed was located within the area where a small breeding plot of cotton grew in 1944, while in adjacent tobacco beds outside the area of the cotton plot no damping-off occurred. This suggests the possible relationship between Fusarium causing damping-off on tobacco and pepper, and the cotton wilt or other Fusarium on cotton, although externally visible symptoms of wilt were not present in the cotton plot.--T. W. Graham, U. S. Department of Agriculture, Bureau of Plant Industry, Soils and Agricultural Engineering, Tobacco Investigations, Florence, South Carolina.

DISEASES REPORTED ON SEED POTATOES IN STORAGE

Reports are of Emergency Plant Disease Prevention Project surveys.

CONDITION OF POTATO SEED-STOCK IN GARRETT COUNTY, MARYLAND: The week of April 16 to 21 was spent in examining the potato seed stock in Garrett County. A number of farms were visited in each of the following areas: Oakland, Gortner, Red House, Gormania (West Virginia), Pleasant Valley, McHenry, Friendsville, Accident, and Grantsville. Varieties encountered were: Sequoia (22 growers), Smooth Rural (18 growers), Sebago (6 growers), Potomac (4 growers), Katahdin (3 growers), Chippewa (2 growers).

Forty-eight of last year's growers were visited, 6 of whom are not planting this year. A number of others are reducing their acreage and none were found who intend to increase their acreage. Most acreages are small, from 1 to 5 acres per farm; 3 or 4 growers plant from 15 to 20 acres each.

Most Garrett County growers use their own seed, practising some degree of field selection, and occasionally (perhaps every 4 or 5 years) renewing their stock by purchasing northern-grown certified seed. The varieties Sebago and Chippewa are recently introduced and are being grown from certified seed of this year or last. A few growers have in the past produced seed certified by the State of Maryland, but no one was found who had done this the past year.

A few potato-storage houses are to be found in the county, but most seed-stocks are stored in the growers' home cellars and show considerable variation in keeping quality. Some of the seed had been graded for size and for visible defects last fall; in other cases the grading had been done recently and decayed tubers had been thrown out; and in a few cases the stock was "field-run". It was therefore not found practicable to make

counts of the various diseases and injuries encountered.

Bacterial ring rot (Corynebacterium sepedonicum) was not found. This disease had been encountered in one lot of seed 2 years ago, apparently having been introduced in northern grown "selected" (uncertified) seed. It was not found last year (survey of Dr. E. A. Walker). Special inquiries were made to learn if any northern uncertified seed had been recently introduced. Apparently it had not.

Scab (Actinomyces scabies) was present in all lots of all varieties, commonly in amounts of 5 to 10%, occasionally in larger amounts, and in a few lots of seed nearly all tubers were badly scabbed. (All growers in the County lime their soil for clover and alfalfa). The variety Potomac was severely affected in the few lots seen.

Dry rot (Fusarium spp.) was also present in all cases, occasionally causing loss as high as 25%, but usually (in field-run stock) in much smaller amount. Late-blight rot (Phytophthora infestans) was found in small amounts (1-2%) in only a few storages. Wilt (Fusarium oxysporum), as evidenced by vascular discoloration, was found only in trace-amounts and in only a few lots of seed, though several growers believed it to be present. Freezing injury was considerable in a few storages in the Oakland area and it was learned that in these cases tubers had been frozen before digging. Freezing injury had apparently contributed to increased loss from dry rot and bacterial soft rot (undet.). Rhizoctonia-russeting (R. solani) was present in one lot of Potomac. Black scurf (same fungus) was not seen. -- A. J. Mix.

IDAHO: During the last week in March, 4 cellars were visited in the Malta-Sublett area (Cassia County) and certified seed potatoes representing about 65 acreas were examined. In general, tubers were keeping well except in one cellar where black rot (Fusarium spp.) had caused severe loss, as much as 25% or more, in the back part of the cellar. It was correlated, according to the grower and inspector, with high temperature resulting from lack of attention and insufficient ventilation. The tubers were large and showed some feather and scald and a considerable number of cuts and bruises. This is a new seed growing area and some factors in production and storing of potatoes are not well understood.

At Blackfoot (Bingham County) one lot of potatoes was examined and rather severe rootknot nematode [Heterodera marioni] injury was observed. This problem is of considerable importance in the area because some such affected lots are used for seed, also infected tubers are fed to stock and the manure scattered on various farms. During the survey the past 2 years, this problem has been encountered frequently.

The largest certified potato seed-producing area in Idaho is in Fremont County in the northeastern part of the State. A total of 2,152 acres were grown in 1944. On March 29-30-31, 14 cellars were visited in the area near Ashton. Most of the other cellars were inaccessible because of deep snows and impossible roads. (Some visits were made by team and sled).

In general, stock in most cellars were in very good condition and rots were not important. Of particular interest, however, was the extreme development of sclerotia of Rhizoctonia on the tubers in some lots. This condition was more pronounced than on any potatoes observed previously and did not seem to be correlated with injury to plants in the field. In some cellars where the stock was quite rough, which was generally considered

due to Rhizoctonia injury in the field, sclerotial formation was extremely slight.

Black rot (Fusarium spp.) was severe in one cellar where tubers were wet from a leaky roof. In one lot of non-certified seed, leak (Pythium debaryanum) was prevalent. Cellar frost was noted in slight amount in many cellars.

The second largest certified seed producing area in the State is located in Teton County (Northeastern Idaho). In 1944, 1,242 acreas of Russett Burbank seed potatoes were raised here. Twenty cellars in this area were visited April 1 to 3. Most of the others were inaccessible because of deep snow and blocked roads.

In 2 very large storages, Fusarium black rot was causing considerable loss. Very high humidity and poor ventilation seemed to be important factors, together with failure to keep the temperature low enough, in causing the development of the rot and sprouting of the tubers. Some cellars showed almost no rots present.

Scab was very common and generally severe in 3 cellars and present in 6 others, or nearly half the storages visited. The occurrence of so much scab in this area has not been recognized before.

In Swan Valley (Bonneville County) 2 cellars were visited and practically no rot was found.

On April 3 to 4 the Lost River Valley area (Butte County) was visited and 7 cellars were examined. Fusarium black rot was again noted as severe in 2 cellars. In one case the damage was confined to rather small pockets in the cellars where soil from the piling machinery caused poor air movement in the bins. This is a new seed-growing area and although some of the storages are new several important storage problems have shown up. In one case pea straw, instead of wheat straw, was used for covering the cellar, and the heat from its decomposition raised the temperature and humidity to adverse extremes.

On April 6 the certified seed grown in the Salmon and Lemhi River areas (Lemhi County) was examined in 4 cellars. Scab was present but in slight amounts. Fusarium black rot was noted as important in one cellar of certified seed and in one of commercials.

Tubers in this area generally are typically light russett with very slight netting. This condition is considered due mainly to an alkali condition of the soil. Yields, however, are good and generally the tubers keep well. -- Earle C. Blodgett.

FREEZING INJURY TO PEAS IN DELAWARE

J. W. Heuberger

Injury to peas observed during the past week is causing serious concern to growers and canners alike. Samples of injured peas were submitted to the University of Delaware for diagnosis on April 25. These peas were examined by P. L. Rice, Extension Entomologist, E. P. Brasher, Extension Horticulturist, and by the writer. No insect or disease trouble was found. The injury was tentatively diagnosed as frost injury, but the possibility of infection caused by some virus still existed. Two plantings of peas at Newark, Delaware, one made on March 17 and the other on April 3, were examined by the writer on April 25. Injury was found in

the planting made on March 17 but not in the one made on April 3. The peas in the April 3 planting were still in the ground when frost occurred on April 5 and 6 whereas those in the March 17 planting were 3 inches tall. The growing point in these plants was killed by the frost. On April 25 it was found that these plants had produced new shoots, generally from the base of the plant, which were 4 to 5 inches tall. No injury was found on these shoots.

At the request of the canning industry, a survey of pea plantings in the eastern half of Sussex County was made by the writer on April 26. This survey was made in cooperation with representatives of the Torsch Canning Co., Draper Canning Co., Stockley Bros. Canning Co., the Dulaney Company, and Frank Gordy and William Henderson of the Delaware Agricultural Extension Service. The survey covered the principal pea-growing areas in the eastern half of Sussex County. It was found that all fields that were planted late enough so that the peas were not through the ground, or were just coming through, when heavy frosts occurred on April 5 and 6 were not injured. Fields planted earlier so that the vines were various heights when frost occurred showed various degrees of injury. The injury in all cases was the same -- injury to the growing point present when frost occurred. This injury is now showing up as cessation of growth at the top of the plant and deformation of the last leaf. The stipules are reduced in size and are of abnormal shape, being relatively long and narrow, and crinkled, with irregular or wavy margins. The first leaflets are malformed and reduced in size, generally being crinkled and long and narrow. Usually, only the first pair of leaflets had developed, the second pair having been suppressed. In all cases the tendril on the injured leaf was malformed. These distorted leaves were those surrounding the growing point when frost occurred. They were not killed but were injured sufficiently to prevent normal growth. The growing point, being the most tender part of the plant, was killed in many cases. Thus, growth generally ceased at the top of the plant. In severely injured fields another symptom of frost damage was present on the older leaves present when frost occurred. This injury is now showing up as light to dark brown streaks between the main veins on the under side of the leaves. These streaks are also on the stems. One characteristic common to all severely injured plants is the production of secondary shoots, generally at the ground line or below. In the case of less severely injured plants the secondary shoot, or shoots, is produced just below the injured area. These secondary shoots are not present on uninjured plants. The immediate physiological response of pea plants when their growing point is injured is to send out secondary shoots from the first uninjured area of meristematic bud tissue down the stem from the injured area. All the symptoms described above are similar to those described by Walker[1] for freezing injury to canning peas in Wisconsin in 1938.

In general, injury appears to be more severe in the Milton-Rehoboth area than in the Milford area; the Alaska varieties seem to be more seriously damaged than the sweet varieties, such as Pride and Thomas Laxton; and the later plantings are not so much damaged as the earlier plantings.

As frost damage on peas in Delaware is a rare occurrence, it is of interest to ascertain why frost damage occurred this season. The growing weather from the middle of March until frost on April 5 and 6 was extremely warm, there being many days with temperatures 80° F and above. This made

[1] Walker, J. C. Freezing injury to canning peas. Phytopath. 29:188-194. 1939.

for rapid, succulent, tender growth. Such growth is more easily injured by frost than is normal growth (Walker loc. cit.). During April 5 and 6 the temperature in the Milton-Rehoboth area dropped to 26° F and ice froze a quarter of an inch thick. This temperature was ample to injure tender growing peas severely.

As frost injury may be confused with pea mosaic, a close watch was kept during the survey for this disease but only one infected planting was found. The symptoms were a distinct mottling of the foliage, reduction in leaf size, and stunting of the plant. No injury to the growing point was found.

A few aphis were found in some fields. The light infestation of aphis present on April 26, coupled with the fact that field men of the canning companies first began to find aphis only a few days before, indicates that the damage in the pea fields was not caused by pea mosaic as aphis are necessary for infection of the plant with mosaic. Also, as the incubation period of the virus in the plant is from 6 to 14 days before symptoms appear, aphis infestation would have had to be fairly high 3 weeks ago to have produced considerable infection. Further, another factor indicating that the damage in pea fields is not due to mosaic is that all growth on uninjured plants, and all new growth on injured plants, is free of injury symptoms.

The important question at the moment is -- how seriously is the pea crop damaged? It is difficult to give a definite answer. It is certain, however, that the yield and quality of peas will depend to a great extent on what the secondary shoots now growing on the injured plants do. Given good growing weather from now on, and freedom from serious aphid and root rot attacks, these shoots will make peas. However, maturity in injured fields will be uneven and late, making for poorer quality. At the moment it seems that the later-planted fields will produce a fair crop of rather uniform maturity. Earlier-planted fields may not do so well. Also, it appears that the sweet varieties may do better than the Alaska varieties.

DEPARTMENT OF PLANT PATHOLOGY, DELAWARE AGRICULTURAL EXPERIMENT STATION, NEWARK, DELAWARE.

REPORTS ON DISEASES OF VARIOUS VEGETABLE CROPS

Reports are of Emergency Plant Disease Prevention Project surveys.

BEAN DISEASES IN SOUTHERN LOUISIANA: A one-day survey was made with Dr. L. H. Person in the bean areas of Denham Springs and Gonzales. The following diseases were found: Trace amounts of stem canker (Rhizoctonia solani) and of southern wilt (Sclerotium rolfsii) were noted. Stem rot due to Sclerotinia sclerotiorum was found in one field near Denham Springs where it was causing slight damage. This is perhaps the first report of Sclerotinia stem rot of bean in Louisiana. A moderate to severe chlorosis and stunting, assumed to be due to acid soil since liming is known to correct the condition, was also noted in many fields in this area.

Bacterial blight, both common (Phytomonas [Xanthomonas] phaseoli) and halo (P. [Pseudomonas] medicaginis var. phaseolicola) had caused severe damage in about 20 acres of beans on one farm at LaPlace.

In a few fields near Hammond and Pontchatoula, where beans were hill-

planted instead of drilled, southern wilt had caused severe damage. -- Douglas C. Bain, Apr. 16-28.

BOLTING OF CABBAGE IN MISSISSIPPI AND TEXAS: A rather large acreage of cabbage was planted in the Crystal Springs area of MISSISSIPPI. At the beginning of April plants appeared to be unusually free from diseases; there was, however, a considerable amount of bolting in fields of nearly grown cabbage. This condition was very common at the same time last year. Apparently the growers, in a hurry to obtain an early crop, plant seeds too early in the fall and consequently must hold plants in seed-beds and cold-frames too long before warm weather. -- Douglas C. Bain, Mar. 19-Apr. 5.

Cabbage plant farms in the Jacksonville area of TEXAS were visited with Dr. P. A. Young, on March 27, to obtain information about the bolting reported in cabbage from this area. There was relatively little disease in the cabbage beds -- a trace of Rhizoctonia solani root rot and a trace to moderate infection by Peronospora parasitica. In general the cabbage was in good condition. The bolting was in the variety Charleston Wakefield and the growers had already agreed not to ship any more of this variety. Mr. Harne Drewes, a seed company cabbage breeder, suggested as explanation that the cold weather in December followed by an unusual, warm winter with relatively high temperatures had induced bolting in this variety. Other varieties apparently were not affected. -- R. D. Watson.

CERCOSPORELLA LEAF SPOT OF KALE IN OREGON: Cercosporella albomaculans was collected March 13 on young kale plants being grown for a seed crop, in Linn County. Distribution in the field was patchy, and the disease in general had caused no significant damage. -- Lytton W. Boyle.

DISEASES ON LETTUCE AND OTHER VEGETABLES IN NORTHERN NEW JERSEY: Report of eighth visit to Northern New Jersey vegetable growers, April 25 to 27.

Gray mold (Botrytis sp.) of lettuce had continued and increased somewhat on all farms where previously observed (Farms 4, 5, 9, 11, 15, 18, 19). It was observed for the first time at Farms 3 and 20, where it had not been seen in seedling-frames, but since it occurs at these farms only in the more recent field-plantings it is believed that its earlier occurrence in frames had been overlooked. Loss of stand from this disease amounts to from 5 to 15% in Romaine and from 1 to 2% in Iceberg. The greatest loss is at Farms 11 and 18, where the earliest and most severe occurrence in seedling-frames had been observed. It is still absent at Farms 7, 10, 12, 16, and 17, where it has never been seen attacking seedlings in frames. These observations are taken to indicate a definite carry-over of this disease from seed-beds to permanent frames and to fields.

Drop (Sclerotinia minor) of Iceberg lettuce was found causing about 2% loss in the field at Farm 4, and to the same extent in frames and field at Farm 11.

Drop (Sclerotinia sclerotiorum) of Boston lettuce was found causing considerable damage to the frame-crop at Farm 15. The lettuce was nearly mature (cutting was expected to begin in 3 or 4 days), and the plants had spread until they touched and overlapped, completely covering the soil. This was the first occurrence of this disease on this farm, and it was not found here in field-grown Boston lettuce, which was at a considerably earlier stage of growth. Only a few other growers, among those usually visited, mature Boston lettuce in frames, and the disease has not yet been

seen on their farms. However, it was found to be prevalent and damaging at 3 other farms not usually visited. (These farms are close to Farm 15). When observed the disease had already been responsible for about 10% loss and it was spreading rapidly.

Mosaic (virus) of lettuce was found present in amounts of from 4 to 6% in all 3 types, Boston, Iceberg, and Romaine, at all lettuce-growing farms. It had become evident following cool weather which had prevailed since the previous visit. No insect infestation of lettuce has been seen at any of these farms.

The damping-off and root injury (cause undetermined) of pepper seedlings in the greenhouse at Farm 6 had not occurred in later sowings, but the same or a similar trouble was present in 2-weeks-old eggplant seedlings.

The frequently reported (and still undetermined) lettuce injury at the Farm 12 cannot be followed further. Only the best plants were selected for field-planting and these plants cannot now be distinguished from completely healthy plants. -- A. J. Mix.

ONION BLIGHT IN SOUTHERN TEXAS: A survey was made of the onion "blight" trouble (cause undetermined) in South Texas onion-growing areas during March. The trip from the Winter Garden area to the Lower Valley was made in company with Dr. Wm. H. Ewart and Dr. Spas S. Ivanoff. Dr. George H. Godfrey accompanied us in the Lower Rio Grande Valley, and to the Coastal Bend area where we met Mr. George E. Altstatt and Dr. Allen Trotter.

Up until March 19 there was no real blight in the Winter Garden area, and as far south as Laredo, tip-burn and thrip injury were common. South of Laredo, in Zapata County, several fields showing typical blight were observed, and growers reported that it had appeared following rainy, muggy weather. The lower 3 to 5 leaves were browned and dead at that time. Throughout the Valley and Coastal Bend areas blight had appeared earlier and was general and fairly severe. Throughout both areas from 4 to 8 or more leaves on affected plants were dead and the new growth had produced very long "necks" on the onions. This injury was typically associated with several types of leaf spots described by Mr. Altstatt in earlier reports.

Onions in the Coastal Bend area were most severely damaged by blight. The amount decreased toward the interior, and in Live Oak, Atascosa, and Frio Counties there was little blight damage by March 22.

On our return to the Winter Haven area we found that the lower leaves had blighted down during or after a period of hot, muggy weather following rain. This blight had occurred with relatively little of the spotting and leaf scorch preceding it as is typically the case in the Coastal Bend area.

The blight trouble is a very important factor to be dealt with in onion production and the loss of the lower 3 to 8 or more leaves of the onion increases the length of neck and reduces the vigor of the plant, which has a marked effect on its ability to produce a bulb crop. A conservative estimate of the losses this year due to this disease would probably range from 15 to 50% of the bulb crop.

Dr. Trotter, who is located in the most severely and most often affected Coastal Bend area, observes that blight has occasionally occurred as early as February but that it occurs most years in March. Of the early short day onions grown for bulbs in Texas the Crystal Wax is the most sus-

ceptible to blight, Yellow Bermuda next, the Babosa (early Grano), then Grano types, while apparently the Creole types are least susceptible.

Conditions favoring blight appear to be misty or muggy warm weather.-- R. D. Watson.

DISEASES OBSERVED ON ONION AND SHALLOT IN LOUISIANA: Downy mildew (Peronospora destructor) was observed on leaves and stalks in a small planting of red shallot near Pontchatoula.

A one-day trip was made with Dr. E. C. Tims to southwestern Louisiana to inspect Creole onions being grown for seed. Downy mildew was responsible for considerable damage in one large field near New Iberia. A small amount of purple blotch (Macrosporium [Alternaria] porri) was found in another field. A blast or blight of the pedicels was noted in one large field near Breaux Bridge. A species of Alternaria with long-tailed conidia was constantly found to be associated with the diseased pedicels. The disease had caused a loss of seed estimated at 5% thus far.

What appears to be mosaic was found in Nothoscordium fragrans, a liliaceous weed of the tribe Allieae, here in Baton Rouge. Specimens have been sent to Dr. Philip Brierley of the U. S. Division of Fruit and Vegetable Crops and Diseases for identification. -- Douglas C. Bain, Apr. 9-14, Apr. 16-28.

DISEASES OF SPINACH IN THE WINTER GARDEN REGION OF TEXAS: White rust (Albugo occidentalis) is the most destructive disease on spinach in this area. This year it was more common and destructive than usual because of the excessive rainfall during February, March and early April. By March 1 most fields were affected and heavy damage was being experienced; many fields were a total loss. By March 15 to 20 the disease was common everywhere, and only a few fields were harvested after this date. Most of the late planted spinach was lost due to white rust.

Downy mildew or blue mold (Peronospora effusa) was widespread and very common; infection ranged from a trace to 100% of the plants affected.

Losses are difficult to estimate because the plants will often outgrow the infection and loss is chiefly due to delay in growth and harvest date.

Aster yellows (virus) occurred on from a trace to 5% of the spinach in the area. A few plants affected by curly top (virus) were observed in most fields, with as much as 1% infection in one field. Occasional plants affected by mosaic (virus) were observed throughout the area. — R. D. Watson, Mar.-Apr.

DOWNY MILDEW AND ROOT ROT OF SPINACH IN CALIFORNIA: In the Mission district of the Salinas Valley slight amounts of downy mildew were present in most spinach fields. A root rot was observed in spotted areas of about 1/4-acre each in each of 2 fields of 5 and 20 acres, respectively, and other small spots were present. Several other fields observed were free from the disease. Specimens were submitted to Dr. J. T. Barrett, who isolated Phytophthora megasperma, as had been done previously from spinach plants with root rot (PDR 28: 448). -- Henry Schneider, Mar. 26-31.

FURTHER SURVEY FOR TOBACCO DOWNY MILDEW IN SOUTH CAROLINA

Alton E. Prince

As a follow-up of the survey of tobacco beds in eastern South Carolina during the week of March 19, 2 additional surveys, on April 10 and April 18, were made to determine the damage and loss caused by downy mildew [Peronospora tabacina]. On the first date the writer was accompanied by Dr. E. E. Clayton and Mr. T. W. Graham of the Division of Tobacco Investigations, and on the second date by Mr. Graham.

When the unfavorable weather conditions for dispersal of spores and infection by the fungus are considered, downy mildew was severe, since all beds observed were infected sooner or later, often with severe defoliation and in some beds killing of the plants.

Weather during the initial infection period in March was unfavorable for dispersal of the spores, but a few days of favorable weather followed and during this period the plants in all beds seem to have been inoculated. It should be stated that, even though weather again became unfavorable and damage was reduced, there is evidence indicating continued spread of the fungus.

Several old beds in which plants were infected when examined in March were re-inspected on April 10. In these beds plants that had recovered from infection were healthier than plants in new beds that were just becoming infected or were just recovering; however, on April 18 there appeared to be little difference between plants in old and new beds.

Actual loss from downy mildew this year was relatively light because of several factors. Even though all beds were infected, with a resultant delay of about 2 weeks after the plants would have been ready to set if the fungus had not been present, this occurred before the usual setting season which is about April 20. On April 18 most fields seen had already been set once and resetting had started. The resetting was necessary because of the very dry ground conditions that existed before a heavy rain on April 17. Therefore, loss resulting this year from tobacco downy mildew in eastern South Carolina was limited mostly to the extra bed space prepared and planted that would not have been necessary if the disease were not present. Most growers now plant double the area of bed space that they planted before the appearance of downy mildew, or about 1000 yards of bed space for each acre of field to be planted.

It was observed that tobacco is planted in small amounts at intervals across the State to the Georgia line, a factor to be considered in any downy mildew control program.

EMERGENCY PLANT DISEASE PREVENTION PROJECT.

PRELIMINARY STUDIES OF ABACÁ DISEASES IN PANAMA

Otto A. Reinking

The original abacá plantings were made in Panama by the United Fruit Company in cooperation with the United States Government. The planting material was selected in the Philippine Islands from the various varieties grown in the Davao region on the Island of Mindanao. These selections were made in 1925 under the direction of Mr. Harry T. Edwards of

the United States Bureau of Plant Industry, and by the writer who represented the United Fruit Company. The writer inspected the plantings from which planting material was to be selected for possible presence of disease. The following varieties were included: Bungulanon, Maguindanao, Tangongon, Libuton, Puteean, and Sinaba. Mr. Edwards took all planting material to Panama where it was planted out, first in a quarantine area and later in trial field plots. Field plantings were not made on a large scale until 1937.

All abacá varieties were planted on banana lands abandoned because of Panama disease. The commercial plantings were made in 1937 and in 1940, and were not cut for fiber until the latter part of 1942. These plantings were made with a 14 by 14 spacing, a distance that had been shown by previous tests to be best. Because the plants were allowed to grow and multiply without interference, the plantings became very dense and the growth very tall, resulting in a condition of high humidity with little aeration. In all plantings of Maguindanao visited the tops were entirely closed in with the top leaves. Plantings of Bungulanon, a shorter variety, were somewhat more open. This discussion of conditions is given because of their possible bearing on the stalk rot discussed later.

The abacá plant apparently is subject to few diseases. Those noted were the following: Panama disease, stalk rot, and an apparent debilitation disease.

Panama Disease [Fusarium oxysporum f. cubense]. Panama disease is rare in abacá plantings made on banana soil infested with the causal organism. It was noted by the writer in 1927 in the original variety plantings but was not serious. Only a few young plants were affected and these outgrew the disease. In January 1943, when the present inspection was made, no Panama disease of importance was in evidence. Because it has been so scarce during all of these years it appears that this disease never will become a serious problem on abacá.

Stalk Rot. A stalk rot has appeared, primarily on Maguindanao. The company officials thought this disease might be similar to the so-called Helminthosporium rot occurring in the Philippines. At the time the writer inspected the original abacá variety selections in the Philippines in 1925 this stalk rot was not observed.

The disease is characterized by a rot of the leaf bases, starting usually at the axil and progressing downward. The outer, older leaves rot and cease growing, thereby causing a collar rot that chokes the plant. Affected plants are stunted and do not produce fruit. In advanced cases the top of the plant falls over. Rotted spots may be found in the lower part of the pseudo stem. The rotted areas extend through the first leaf sheath into the second and sometimes deeper into the third. No heart rot is produced. The outer diseased and dead leaves are usually covered with a white fungus growth that appears to be secondary. In severe cases of top infection the upper part of the plant is ruined for fiber extraction. When this is serious there may be a loss of fiber.

Examinations made on January 13, 1943 of plants in the Filipina farms in Sections 58 and 60, showed that some plants in almost 100% of the mats were affected and that a high percentage of the plants in many mats showed disease. As stated above, the growth in this area was very heavy, with extremely dense production of plants. Such a condition is abnormal, producing a very rank and succulent growth. This type of growth, along with the high humidity and insufficient aeration in the plantation, would appear

to be conducive to attack by a weak parasitic fungus. This planting was made in 1937 and had not been pruned out. A planting on Davao farms made in 1940 showed less disease, but some was present in the very heavy and tall growth of plants. Apparently the disease is more prevalent in the older plantings that have not been kept pruned, such as those on the Filipina farms. It may be presumed that the choked condition of the many plants in the mats of plantings of this age produces weakened plants that would be subject to the attack of a weak parasite on the outer, older, almost mature leaves. When these are attacked they appear to be cemented together by the fungus strands and in this manner choke the inner, younger green leaves and cause a stunting in their growth.

Specimens of diseased plants, with all types and stages of disease, were collected and taken to the hospital laboratory for microscopic examination. No pathogenic fungus spores were found, and no indication of the presence of Helminthosporium spores. A white, matted fungus growth present in all diseased material appeared to penetrate the older, weakened leaves. Cultures from typical lesions, when examined on January 17, showed only the presence of bacteria. Material cut from the inner parts of diseased leaf sheaths, when placed in a damp chamber, failed to produce any fungus growth 5 days later.

While nothing definite can be stated in regard to its cause after such brief inspection and study, it is believed that the disease may not be serious in normally cleaned and pruned abacá. It apparently is caused by a weak parasite that attacks the weakened leaves, cementing them together and thereby causing a secondary collar rot. Further studies are essential to prove this assumption.

For the present it is desirable to determine whether the trouble can be eliminated by special cultural methods. It was suggested, therefore, that 20-acre sections of the Maguindanao planting in both the 1937 and 1940 plantings be pruned out completely as would be done in normal cultural practices for fiber production, and kept pruned out every 3 months, the pruning to include not only the plants that have "shot", but also mature plants about ready to "shoot". If this is done the planting will be opened up to light and air and the growth will be slowed down and become more normal. It is believed that this practice will eliminate the so-called stalk rot. This test should be run for a period of at least 2 years for definite results. If new areas are planted they should be kept pruned according to normal practices from the start, and in this way prevent the badly crowded condition of plants and possibly avoid the disease.

Further studies of a possible causal organism are advisable but it is believed that these field tests will tell the story. If it is shown that the disease can be avoided in this manner planting material from the Maguindanao variety may be used for dissemination.

Collar rot has been observed in the Bungulanon variety but to a much less extent. No disease has been observed in the Libuton variety. Both varieties produce a smaller and less rank growth than Maguindanao.

Debilitated Plants. An area of Bungulanon plants in sections 164 and 165 of the Filipina farms planted in 1937 were stunted and weak. The tops of the plants were healthy and showed no signs of a virus trouble or other disease. The weakened plants could be pulled over easily because of a rotted root system. Only a localized area of the farm was affected. The rest of the planting contained good healthy plants. It appears that

some local soil or drainage condition resulted in weakened plants, an assumption made by many who have observed the affected area. The area will be dug, redrained, and replanted. Apparently the trouble is not caused by any fungus or insect, but, as suggested, is due to some unfavorable cultural factor; however, the condition will bear watching and further checking relative to a possible fungus causal agent. January 15, 1943.